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PRINCIPAL INVESTIGATOR: Dr. Gregory Foltz

CONTRACTING ORGANIZATION: Swedish Health Services, Seattle, WA 98122-4379

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INTRODUCTION

Through this collaborative research effort, we intend to develop quantitative tools with direct applications for patients with glioblastoma. We will pursue new strategies for genome sequencing and new technologies for the genetic analyses of cancer mechanisms, as well as methods for assessment of progression and stratification of human glioblastoma. This proposal will significantly advance genomic, proteomic and single-cell technologies, and the proposed tools will be generally applicable to all cancer-based studies to identify and quantify DNA, RNAs, proteins and cells, challenges ubiquitous to all human disease systems.

The expected outcomes and deliverables will be: 1) deeper understanding of human glioblastoma disease mechanisms; 2) blood protein biomarkers useful in early diagnosis, stratification, and assessment of glioblastoma progression, assessment of drug treatment effectiveness, and early detection of disease recurrence; 3) new strategies for genomic sequencing to identify relevant mutations; 4) new technologies for transcriptome, miRNAome, proteome, and single-cell analyses, and 5) the creation of quantized glioblastoma cell lines that can be used for general molecular characterization as well as to assess the biology of this cancer and the effectiveness of existing drugs in reacting with these cell types.

BODY

During the past year, the research team at the Ivy Center for Advanced Brain Tumor Treatment has made progress in two key areas:

- Regulatory: all necessary protocol and informed consent modifications have been made and all associated IRB approvals have been obtained.
- Tumor collection: we have begun collecting GBM tumor tissue under the IRB approvals required for inclusion in this project.

The Ivy Center research team has modified two existing research protocols (the Glioblastoma Biomarker Database, and the SNI Healthy Donors Repository) and their associated informed consent forms for compliance with DoD regulatory requirements.

Both research protocols were modified to allow for transfer of tumor samples to the ISB for the purposes of this project, and the associated informed consent forms were modified to accurately disclose the additional uses of patient samples. The modified documents were reviewed by DoD regulatory experts, at which point additional changes were then requested. Those changes resulted in further protocol and consent modifications, and subsequent IRB submission. IRB approval was granted on 3/27/2012.

Since receiving IRB approval, we have begun to collect GBM samples to be transferred to the Institute for Systems Biology following completion of all regulatory requirements at that site. Over twenty potentially eligible samples have been collected to date.

KEY RESEARCH ACCOMPLISHMENTS

None.

REPORTABLE OUTCOMES

No reportable outcomes have been established for 2011/2012 period.

CONCLUSION

Description of work to be performed during the next reporting period.

Over the next 12 months (July 2012 – June 2013) the primary focus for the participating research team at the Ivy Center for Advanced Brain Tumor Treatment will be GBM tumor sample collection. As part of our ongoing research efforts, we will continue to collect freshly excised GBM tumor samples. From the tumor samples collected at the Ivy Center, qualifying tissue samples will be transferred to the Institute for Systems Biology for purification into quantized cell types, single-cell transcriptome analyses, stratification of key informational molecules, establishment of cell lines, and complete genomic sequencing of those quantized cell lines. In addition, the Ivy Center research team will begin assessing the cell lines collected for this project for responses to chemotherapy agents and other glioblastoma-relevant drugs, to impedance match each cell type against effective drug responses.

REFERENCES

N/A

APPENDICES

N/A